

WE CLAIM:

1. A sewing apparatus in which a thread cassette holding a needle thread wound is used, comprising:

5            a cassette mount to which the thread cassette is detachably attached;  
              a carrier carrying the thread cassette between an attachment start position and an attachment finish position in the cassette mount; and  
              a control device for controlling the carrier.

10            2. A sewing apparatus according to claim 1, further comprising a supporting member for supporting the thread cassette, wherein the carrier includes a contact member brought into contact with the thread cassette or the supporting member and a driver for moving or rotating the contact member, and the control device controls the driver so that the contact member is moved or rotated in a predetermined direction for insertion of the thread cassette into the cassette mount.

15            3. A sewing apparatus according to claim 1, further comprising a supporting member for supporting the thread cassette, wherein the carrier includes a contact member brought into contact with the thread cassette or the supporting member and a driver for moving or rotating the contact member, and the control device controls the driver so that the contact member is moved or rotated a predetermined amount for insertion of the thread cassette into the cassette mount.

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4. A sewing apparatus according to claim 2, further comprising a detector detecting the thread cassette or the supporting member placed at the attachment start position in the cassette mount, wherein the control

device controls the driver so that the movement or rotation of the contact member in the predetermined direction is started when the detector has detected the thread cassette or the supporting member placed at the attachment start position.

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5. A sewing apparatus according to claim 3, further comprising a detector detecting the thread cassette or the supporting member placed at the attachment start position in the cassette mount, wherein the control device controls the driver so that the movement or rotation of the contact member by the predetermined amount is started when the detector has detected the thread cassette or the supporting member placed at the attachment start position.

10 6. A sewing apparatus according to claim 2, further comprising a detector detecting the thread cassette or the supporting member having reached the attachment finish position, wherein the control device controls the driver so that movement or rotation of the contact member is stopped when the detector has detected the thread cassette or the supporting member having reached the attachment finish position.

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7. A sewing apparatus according to claim 3, further comprising a detector detecting the thread cassette or the supporting member having reached the attachment finish position, wherein the control device controls the driver so that movement or rotation of the contact member is stopped when the detector has detected the thread cassette or the supporting member having reached the attachment finish position.

25 8. A sewing apparatus according to claim 6, wherein the control

device controls the driver so that movement or rotation of the contact member is stopped when the detector has not detected the thread cassette or the supporting member having reached the attachment finish position, within a predetermined period of time or predetermined number of times of  
5 drive.

9. A sewing apparatus according to claim 7, wherein the control device controls the driver so that movement or rotation of the contact member is stopped when the detector has not detected the thread cassette  
10 or the supporting member having reached the attachment finish position, within a predetermined period of time or predetermined times of drive.

10. A sewing apparatus according to claim 6, further comprising a display device controlled by the control device, wherein when the detector  
15 has detected the thread cassette or the supporting member having reached the attachment finish position, the control device controls the display device so that an indication that the thread cassette has normally been attached to the cassette mount is displayed.

20 11. A sewing apparatus according to claim 8, further comprising a display device controlled by the control device, wherein when the detector has not detected the thread cassette or the supporting member having reached the attachment finish position within the predetermined period of time or predetermined times of drive, the control device controls the display device so that an indication that the thread cassette has not normally been attached to the cassette mount is displayed.  
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12. A sewing apparatus according to claim 11, further comprising a

thread cassette detector for detecting the thread cassette having been ejected from the cassette mount, wherein the control device interrupts displaying by the display device when the thread cassette detector detects ejection of the thread cassette after the display device has displayed the 5 thread cassette not having normally been attached.

13. A sewing apparatus according to claim 1, further comprising a supporting member for supporting the thread cassette, wherein the carrier includes a contact member brought into contact with the thread cassette or 10 the supporting member and a driver for moving or rotating the contact member, and the control device controls the driver so that the contact member is moved or rotated in a predetermined direction for ejection of the thread cassette from the cassette mount.

15 14. A sewing apparatus according to claim 1, further comprising a supporting member for supporting the thread cassette, wherein the carrier includes a contact member brought into contact with the thread cassette or the supporting member and a driver for moving or rotating the contact member, and the control device controls the driver so that the contact 20 member is moved or rotated a predetermined amount for insertion of the thread into the cassette mount.

15. A sewing apparatus according to claim 13, further comprising an ejection detector for detecting the thread cassette having been moved from 25 the attachment finish position in the cassette mount, wherein when the ejection detector detects the thread cassette or the supporting member having been moved from the attachment finish position, the control device controls the driver so that the contact member is subsequently rotated by

predetermined amount.

16. A sewing apparatus according to claim 14, further comprising an ejection detector for detecting the thread cassette having been moved from the attachment finish position in the cassette mount, wherein when the  
5 ejection detector detects the thread cassette or the supporting member having been moved from the attachment finish position, the control device controls the driver so that the contact member is subsequently rotated by predetermined amount.

10 17. A sewing apparatus according to claim 15, wherein the ejection detector comprises a limit switch detecting the thread cassette having been moved from the attachment finish position to a midway position between the attachment start position and the attachment finish position in the cassette mount.

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18. A sewing apparatus according to claim 16, wherein the ejection detector comprises a limit switch detecting the thread cassette having been moved from the attachment finish position to a midway position between the attachment start position and the attachment finish position in the cassette  
20 mount.

19. A sewing apparatus according to claim 15, wherein when movement of the thread cassette or the supporting member from the attachment finish position is not detected within a predetermined time or  
25 within a predetermined number of times of drive, the control device controls the driver so that movement or rotation of the driver is interrupted.

20. A sewing apparatus according to claim 16, wherein when

movement of the thread cassette or the supporting member from the attachment finish position is not detected within a predetermined time or within a predetermined number of times of drive, the control device controls the driver so that movement or rotation of the driver is interrupted.

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21. A sewing apparatus according to claim 15, further comprising a display device controlled by the control device, wherein when the control device controls the driver and finishes a process for ejection of the thread cassette after the ejection detector has detected the thread cassette or the 10 supporting member having been moved from the attachment finish position, the control device controls the display device so that normal ejection of the thread cassette is displayed.

22. A sewing apparatus according to claim 19, further comprising a 15 display device controlled by the control device, wherein when movement of the thread cassette or the supporting member from the attachment finish position is not detected within a predetermined time or within a predetermined number of times of drive, the control device controls the display device so that an indication that the thread cassette has not been 20 normally ejected is displayed.

23. A sewing apparatus according to claim 22, further comprising a thread cassette detector for detecting the thread cassette having been ejected from the cassette mount, wherein the control device interrupts 25 displaying by the display device when the thread cassette detector detects ejection of the thread cassette after the display device has displayed the thread cassette not having normally been ejected.

24. A thread cassette for a sewing apparatus, used with a sewing apparatus including a sewing mechanism and holding a thread for the sewing mechanism, the thread cassette comprising:

5 a contacted portion contacted by a contact member provided on a sewing apparatus to which the thread cassette is attached, so as to be rotated or moved,

wherein the contact member is brought into contact with the contacted portion to be rotated or moved so that the thread cassette is inserted into or ejected from a cassette mount of the sewing apparatus.

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25. A program for a sewing apparatus, operating a computer as a control device for controlling a carrier carrying a thread cassette holding a needle thread wound between an attachment start position and an attachment finish position in a cassette mount to which the thread cassette is 15 detachably attached so that the thread cassette is inserted into and ejected from the cassette mount in order that the thread cassette holding the needle thread may be used with the sewing apparatus.